SEALECTRO DSR-100
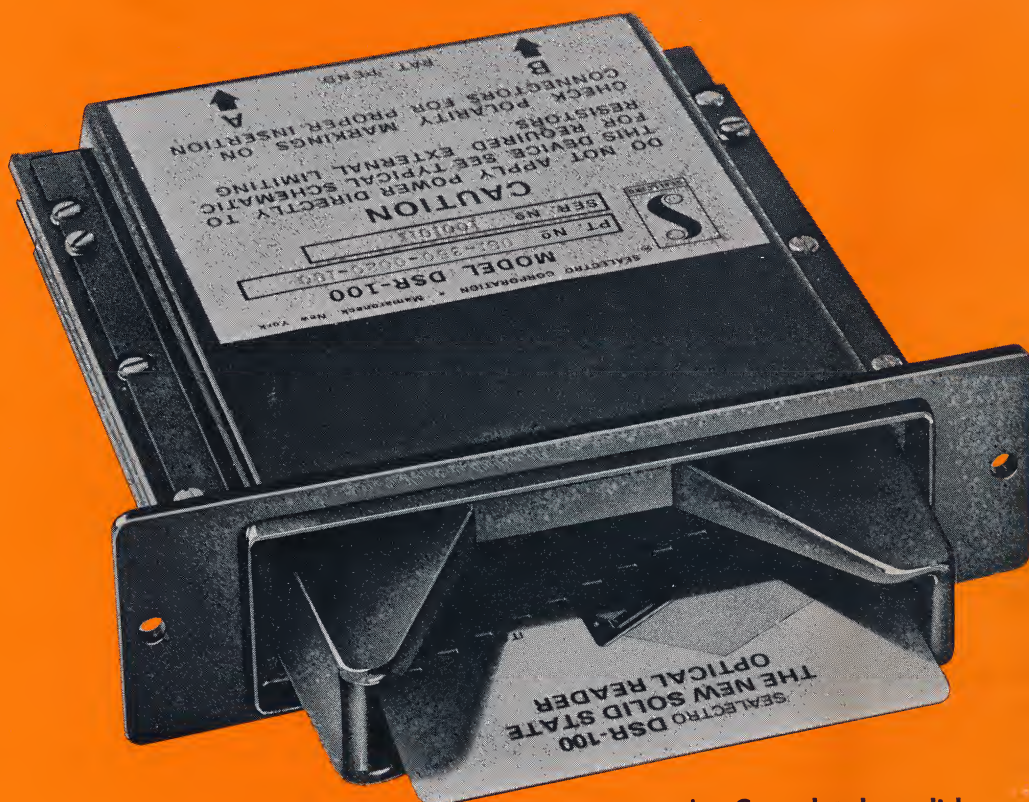
IT SOLVES ALL YOUR READER AND PROGRAM INPUT PROBLEMS

* Completely solid state . . . for extra reliability and long life.

* Models for all standard punched hole badge and tab card styles . . . up to 22 columns.

* Reads complete Alpha-Numeric Hollerith code and others.

* Complete validity check . . . no false data readouts.

* Provides absolute column count . . . regardless of punched data.

* Extra compact . . . fits anywhere in your system.

* Low cost . . . the maximum capability for less $.

® PROGRAMMING DEVICES DIVISION

SEALECTRO
CORPORATION
MAMARONECK, N.Y. 10543
PHONE: 914 698-5600   TWX: 710-566-1110
Sealectro West:
   P.O. Box 5779, Sherman Oaks, Ca. 91413, (213) 990-8131
   1901 Old Middlefield Way, Suite 19, Mountain View, Ca. 94043 (415) 965-1212
Sealectro Ltd., Portsmouth, Hants, England
Sealectro S.A., Zone Industrielle Toulon Est, 83087 Toulon Cedex, France

CIRCUIT COMPONENTS ■ R. F. COMPONENTS ■ PROGRAMMING DEVICES

Introduction

The Sealectro DSR-100 SOLID STATE OPTICAL READER-PROGRAMMER was created to meet the demand for a low cost, highly reliable data input device. Because of its unique design, and through the use of high quality optical sensors and solid state I.R. light sources this objective was achieved.

The DSR-100 embodies many desirable features such as:

Built in Strobe
Orientation Sensing
Tamper Proof Sensors
Full 12 x 22 Format
Automatic Badge Return
Extremely Fast Insertion and Read Cycle
Validity Check
Self Clocking
Reads Badge or Tab Card

Operation

The DSR 100 is simple and easy to use. The badge is manually inserted into the reader and is immediately returned, all data on the badge having been transmitted. The badge can be read on the way in and/or on the way out. A built in strobe provides up to 22 strobe pulses for data verification with simple external logic. A rear sensor is activated when the badge is fully inserted.

Badge or Program Card Orientation is by means of cut corner or round or square orientation hole sensing. External logic coupled to the reader's sensors insure reading of ectly oriented badges only. Any standard opa terial (Mylar, PVC, Polyethylene, etc.) may be   as base material. . The reader will accept all standard badge sizes as shown on page 7.

INTERFACE

The sensor outputs are Open Collector and can be **directly** interfaced into low impedance TTL or high impedance CMOS logic without intermediate circuitry. Reader output is parallel on 10 or 12 Data busses, depending on reader model. Badge columns are read in sequence and are clocked at insertion speed.
The I.R. light sources require external current limiting resistors. The reader mates with standard 20 conductor ribbon cable connectors.

MOUNTING

The DSR-100 may be front removable or rear mounted.

CLEANING

The entire assembly can be disassembled for removal of foreign objects and for general cleaning.

MAINTENANCE

The reader is designed for long life and does not require any lubrication. Sensors and light sources are **individually** replaceable.

APPLICATIONS

The DSR-100 is an ideal solid state device for many diverse applications such as:

Microprocessor Program loading
Data Collection
Personnel Access & ID
Time clock recording
Industrial controls
Automated Equipment Programming
Industrial Batching, Testing
Inspection, Weighing
Frequency Selection
Explosion proof applications

OPTICAL BADGE READER SPECIFICATION
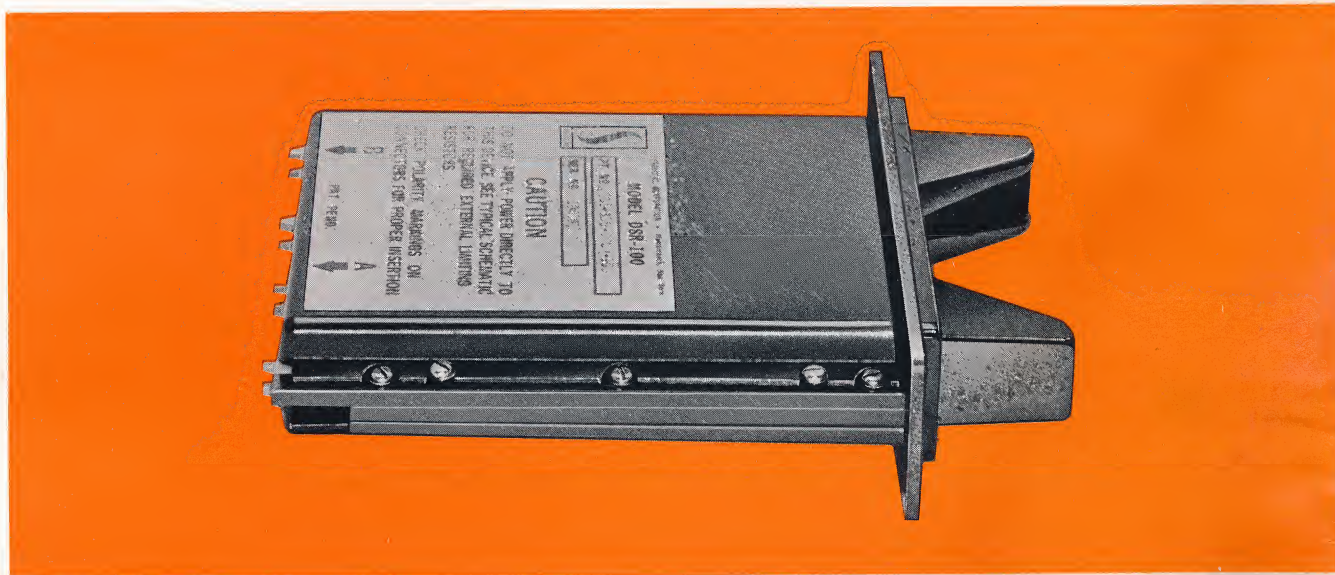
FORMAT

a.   12 Rows x 22 Columns maximum

b.   Reads columns sequentially

c.   Strobe is generated for each column independent of punched data

d.   Reads Hollerith punched holes for full Alpha-Numeric capabilities

e.   Verification of correct badge insertion

TERMINATIONS

T&B/Ansley Blue Macs #609-2012M or equivalent
Mates with #609-2001M
(20 conductor ribbon cable connector)

WEIGHT

12 ounces (.34 kilograms)

ENVIRONMENT

Indoor, office and industrial
Outdoor (in protective enclosure)

TEMPERATURE

Storage: $-40°C$ to $+100°C$

Operating: $-20°C$ to $+85°C$ (to $-40°C$ with load impedance greater than 10,000 ohms)

Humidity: 90% RH

CYCLE TIME

Will respond to any insertion speed

MTBF

750,000 Operations

READER CONSTRUCTION

High impact molded plastic, meets U.S. SE-O specifications, color Black

POWER CONSUMPTION

(Including external current limiting resistors)

	TTL (5V DC)	CMOS (10V DC)
Total Power	2.5 W Typical	2.0 W Typical
Input Current	500 mA Typical	200 mA Typical

INPUT VOLTAGE

5 to 24V DC

PHOTOTRANSISTOR ORGANIZATION

(NPN, Silicon)
Common emitter, individual collector leads out

IR LIGHT EMITTING DIODE ORGANIZATION

(Gallium Arsenide)
Common cathode, individual anode out

PHOTOTRANSISTOR CHARACTERISTICS

(Given at 25°C ambient temperature)

Maximum Power Dissipation: 50mW

Maximum collector to emitter voltage: 50 volts

Maximum emitter to collector voltage: 7 volts

Maximum collector current: 4 mA

Collector Dark Current ($V_{ce} = 30$): 25 nA max.

Collector-Emitter Breakdown Voltage ($I_{ceo} = 100$ uA): 7 V min.

Collector-Emitter Saturation Voltage ($I_{ce} = .4$ mA): 0.3 V typ.

Light Current Rise Time: 3 u Sec. typ.

IR LIGHT EMITTING DIODE CHARACTERISTICS

(Given at 25°C ambient temperature)

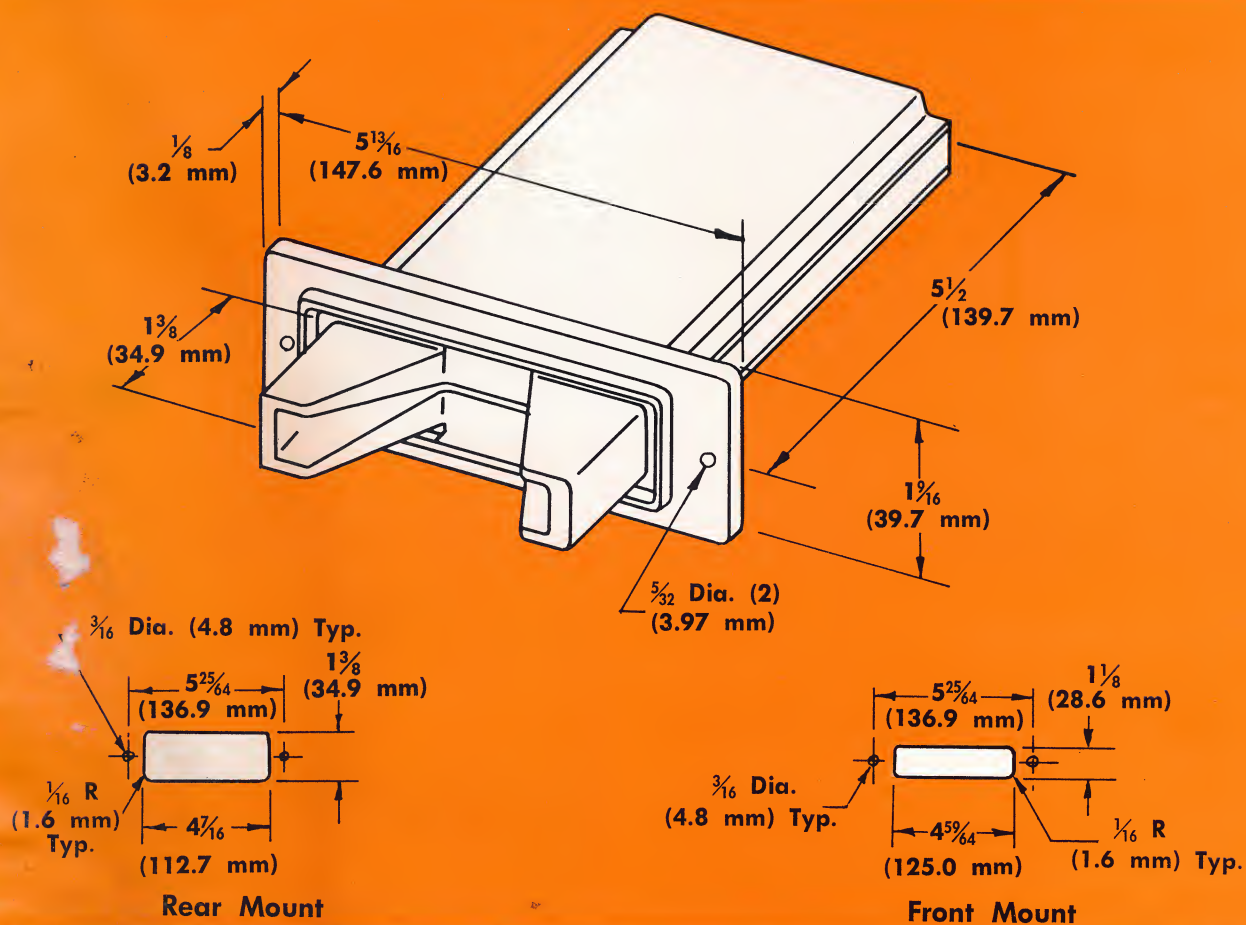Maximum continuous forward current: 100 mA
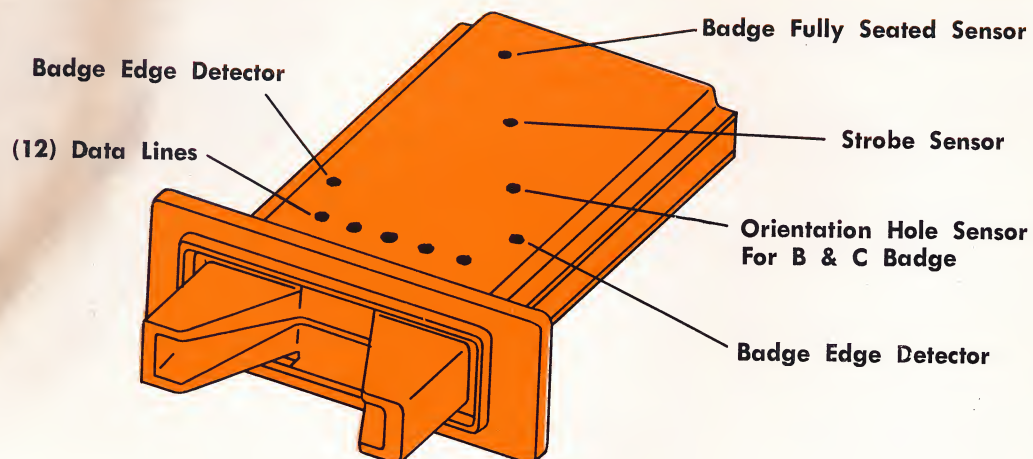
Forward Drop ($I_f = 50$ mA): 1.6V max., 1.3 V typ.

Reverse Breakdown ($I_r = 10$ uA): 2 V

Radiation Rise Time: 0.7 u Sec. typ.

Reader Mounting

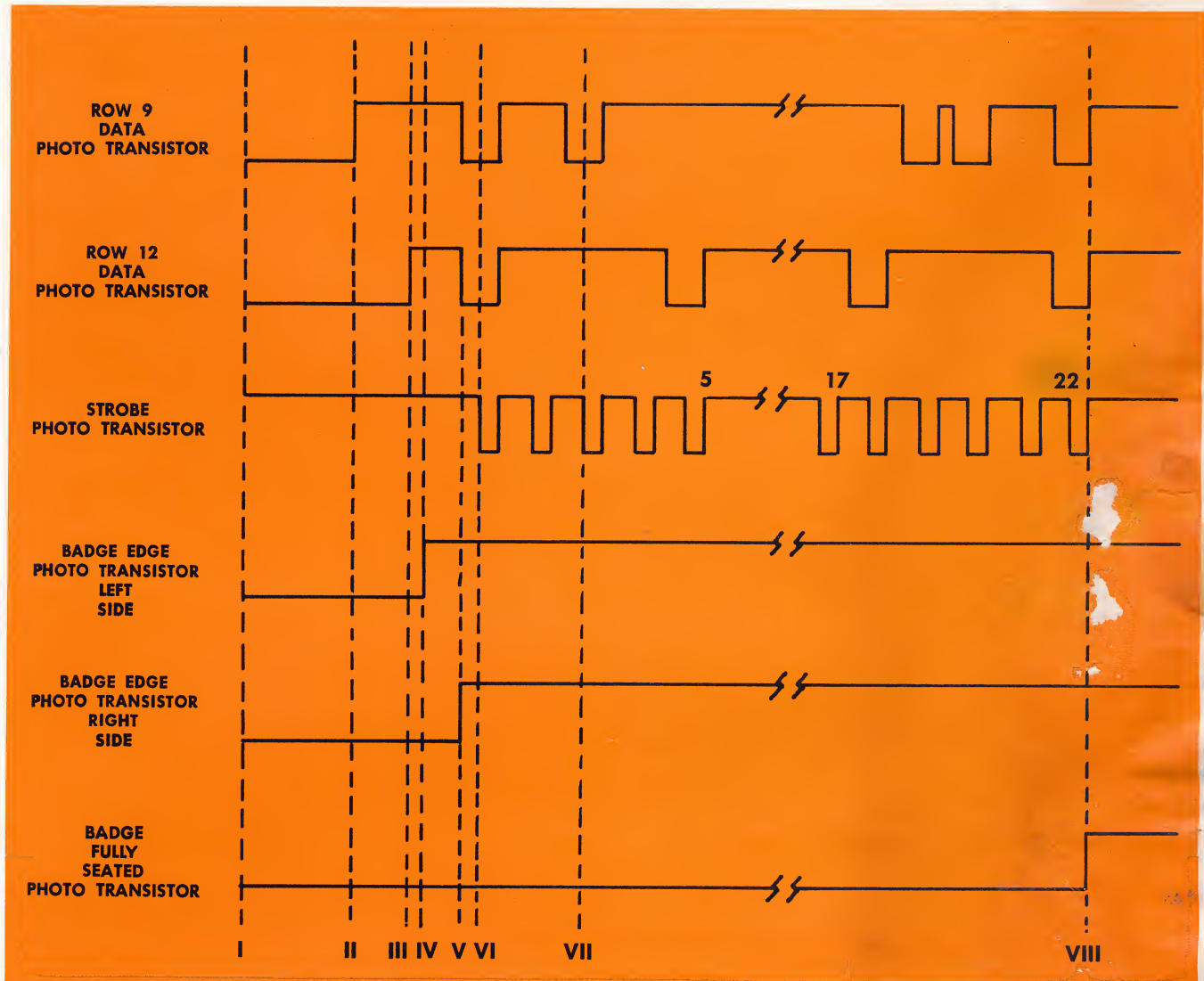|	
$\frac{1}{8}$ (3.2 mm)	$5\frac{13}{16}$ (147.6 mm)
$1\frac{3}{8}$ (34.9 mm)	$5\frac{1}{2}$ (139.7 mm)
	$1\frac{9}{16}$ (39.7 mm)
	$\frac{5}{32}$ Dia. (2) (3.97 mm)

$\frac{3}{16}$ Dia. (4.8 mm) Typ.

$5\frac{25}{64}$ (136.9 mm)

$1\frac{3}{8}$ (34.9 mm)

$\frac{1}{16}$ R (1.6 mm) Typ.

$4\frac{7}{16}$ (112.7 mm)

Rear Mount

$5\frac{25}{64}$ (136.9 mm)

$1\frac{1}{8}$ (28.6 mm)

$\frac{3}{16}$ Dia. (4.8 mm) Typ.

$4\frac{59}{64}$ (125.0 mm)

$\frac{1}{16}$ R (1.6 mm) Typ.

Front Mount

Reader Sensors

Badge Fully Seated Sensor

Badge Edge Detector

Strobe Sensor

(12) Data Lines

Orientation Hole Sensor
For B & C Badge

Badge Edge Detector

DSR-100 Timing Diagram

Typical for "H" & "M" badges only, reading badge on the way in.

When a Badge is inserted in the reader, with proper orientation, the following sequence of outputs occurs: (Note: the rise and fall edges of the outputs are shown idealized, eg. from the output of a non inverting Schmitt trigger.)

I No badge in reader - all photo transistors (PT) are conducting with the exception of the strobe.

II Badge inserted in reader - all row PT's stop conducting except row 12 (no strobe).

III All row PT's (including row 12) stop conducting (no strobe).

IV Badge edge PT, left side, stops conducting (no strobe).

V Badge edge PT, right side, stops conducting (no strobe). At the same time the data window for column one begins to open. In the diagram data is shown punched in Row 9 and 12 (no strobe).

VI Strobe PT starts to conduct, (the lead edge of the strobe always falls within the data column and the trail edge of the strobe terminates before

the next column of data.) Use only strobe lead edge for reading data.

VII Successive data columns are sensed with a strobe generated for each column (up to 22). Data is shown in Row 9, column 3.

VIII Upon full insertion of the badge, the "Badge fully seated" PT stops conducting (no strobe).

IX Any different combinations of phototransistors, conducting in steps I, II, III, IV, V, VI, and VIII indicates improper insertion of badge. For type "B", "C", "F", and "J" badges, points "IV" and "V" on the diagram are coincident at point "IV".

X Badge insertion provides the following strobe counts according to badge type: B-10, C-10, F-20, H-22, J-12, M-22, K-12, K with slot -12.

# Typical Interface Wiring

LED INPUTS

Note:

Series current limiting resistors must be used as shown. 130 Ω is a nominal value only. Guideline for LED current:

Do not exceed 50 mA. Do not use less than 15 mA. (Assume a 1.2 volt drop across LED)

+5VDC
130Ω
130Ω
130Ω
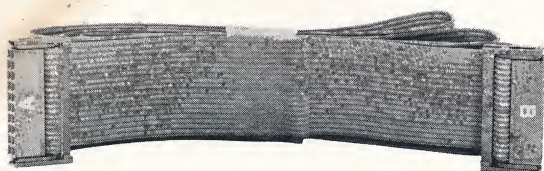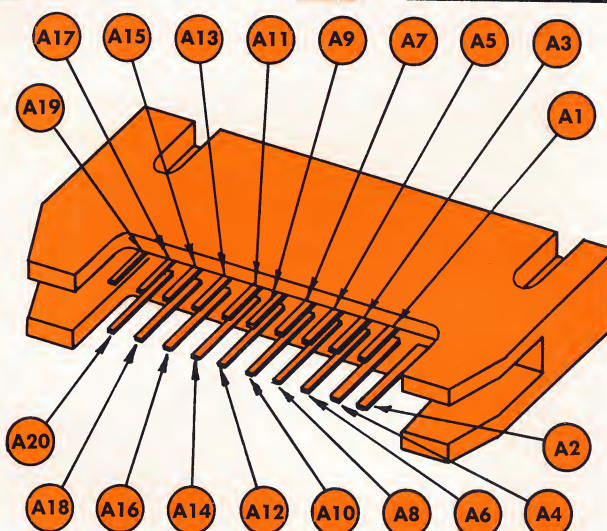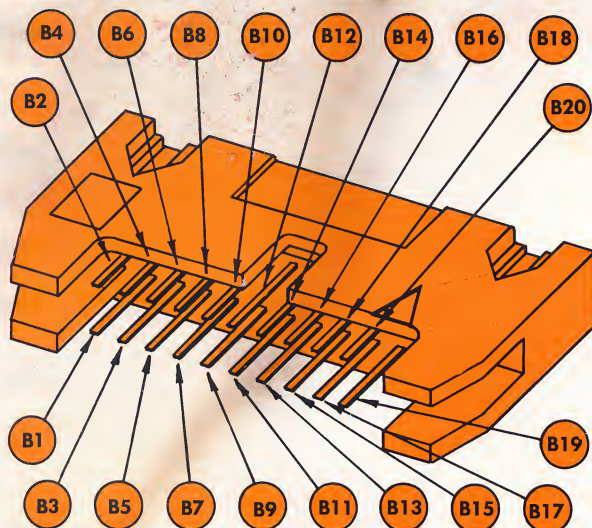Gnd
Connector Points
Strobe LED
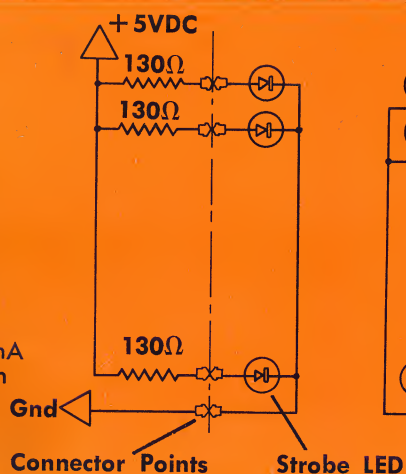
PHOTOTRANSISTOR OUTPUTS

+5VDC
10KΩ
10KΩ
10KΩ
10KΩ
Output
Schmitt Trigger (7414 etc.)
Gnd
Connector Points

Note:

Collector pullup resistors should be used as shown on drawing. 10k Ω is a nominal value. Can be increased to a higher value in accordance with circuit requirements.
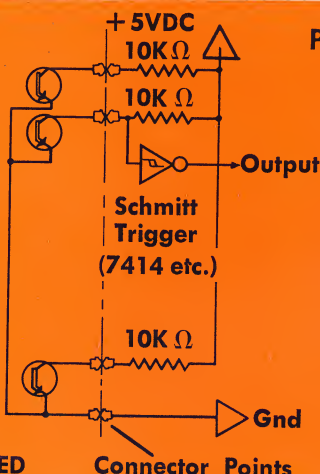
Rear Terminations

Conn. Points	Inputs Light Emitting Diode Anodes	Conn. Points	Connector B Inputs Light Emitting Diode Anodes	Conn. Points	Connector A Outputs Phototransistor Collectors	Conn. Points	Connector A Outputs Phototransistor Collectors
B1		B11	CARD FULLY SEATED	A1	ROW 7	A11	ROW 12
B2		B12	ROW 6	A2	CARD FULLY SEATED	A12	STROBE
B3		B13	COMMON FOR ALL CATHODES	A3	ROW 8	A13	BADGE EDGE DETECTOR RIGHT SIDE
B4	2			A4	ROW 6		
B5	ORIENTATION HOLE DETECTOR FOR B & C BADGES	B14	ROW 7	A5	BADGE EDGE DETECTOR LEFT SIDE	A14	ROW 2
		B15	ROW 9			A15	ORIENTATION HOLE DETECTOR FOR B & C BADGES
B6	ROW 3	B16	STROBE	A6	ROW 5		
B7	BADGE EDGE DETECTOR RIGHT SIDE	B17	BADGE EDGE DETECTOR LEFT SIDE	A7	ROW 9	A16	ROW 1
				A8	ROW 4	A17	ROW 11
B8	4	B18	ROW 8	A9	COMMON FOR ALL EMITTERS	A18	ROW 0
B9	ROW 12	B19	NO CONNECTION			A19	NO CONNECTION
B10	ROW 5	B20	NO CONNECTION	A10	ROW 3	A20	NO CONNECTION

B4 B6 B8 B10 B12 B14 B16 B18
B2
B20
B1
B19
B3 B5 B7 B9 B11 B13 B15 B17

A17 A15 A13 A11 A9 A7 A5 A3
A19
A1
A20
A2
A18 A16 A14 A12 A10 A8 A6 A4

TERMINATING CABLE

PT NO. 813-0602-11-5-006, cable length = 40″ furnished with 2 mating connectors. Cut to suit on installation by user.

Reader Ordering Information

The DSR-100 is available in the following Standard Part Numbers.

BADGE SIZE SELECTION AS DEFINED. MAXIMUM BADGE THICKNESS .048"

081-330-0100-110

12 x 12, reads 12 columns
Badge Type J (Embossed)
Size 3.375 x 2.125
Orientation: Cut corner

081-350-0020-180

12 x 22, reads 22 columns
Badge Type H or M or
            standard tab card
Size 3.250 x 2.328 or 2.343
Orientation: Cut corner

081-330-0040-140

12 x 10 reads 10 columns
Badge Type B or C (Embossed)
Size 3.250 x 2.328
Orientation: Hole sense

081-330-0060-180

12 x 12, reads 12 columns
Badge Type K (embossed)
Size 3.250 x 2.328
Orientation: Cut corner

081-340-0080-110

12 x 20, reads 20 columns
Badge Type F
Size 3.375 x 2.125
Orientation: Cut corner

Standard Badge & Credit Card Specifications
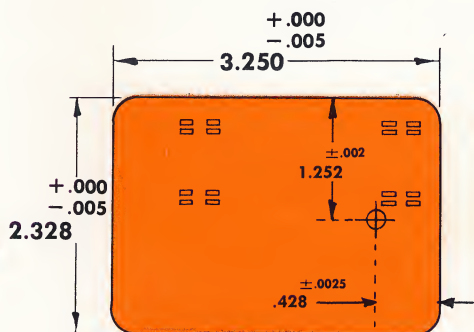
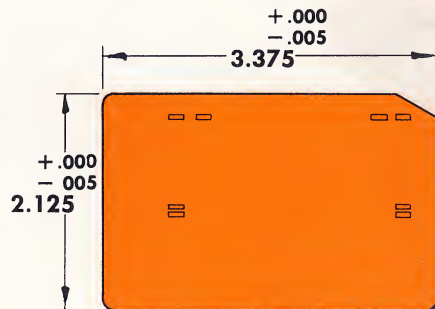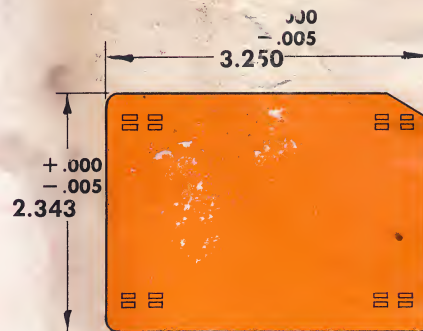

TYPE B (IV)
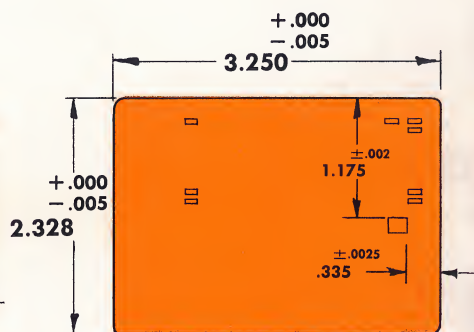
TYPE C (V)
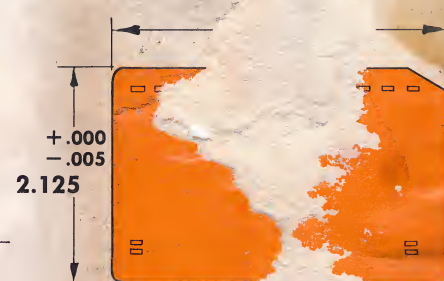
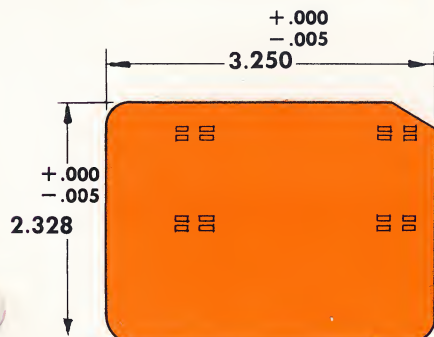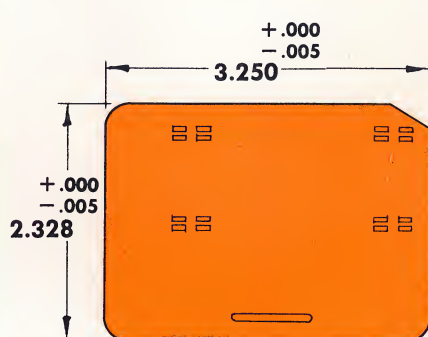
TYPE (II)
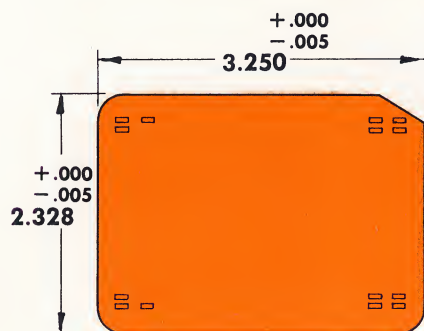
TYPE H

TYPE J

TYPE M (III)

TYPE K

TYPE K (SLOT)

**CORRECT
BADGE INSERTION
WITH READER
LABEL UP**

Other DSR-100 Applications

Program Loading

With DSR-100 using a 264 bit badge or tab card Micro Processor, Mini Computer, industrial controller programming can be easily accomplished with the DSR-100. It provides unlimited bit (data) input utilizing shift register address data verification and internal fault detection capability. This is accomplished through the use of IR-LED, phototransistor circuitry which generates non-concurrent strobe and data pulse information providing a real time discrete parallel output. This can be readily converted to BCD, Hollerith or other suitable outputs.

Badges containing up to 264 bits can be loaded in rapid fashion into the DSR-100. They can be color coded for batching applications. They can also be imprinted for easier identification.

Time Clock System	Machine Controls
Access System	Industrial Data Collection
Security	Hospital Patient ID
Parking Lots	

Compared to other input devices such as thumbwheel switches, keyboards or toggle switches, the DSR-100 provides a faster and error free method of programming for a wide range of today's computer applications such as:

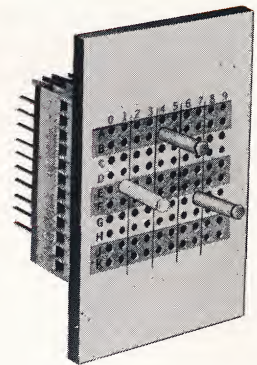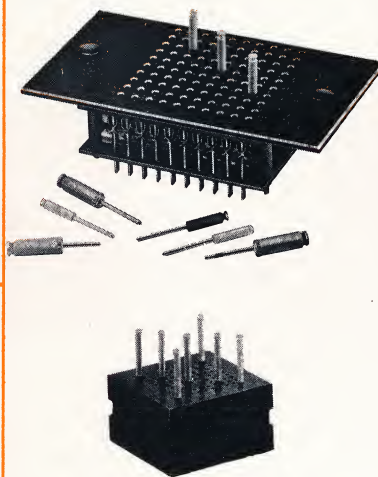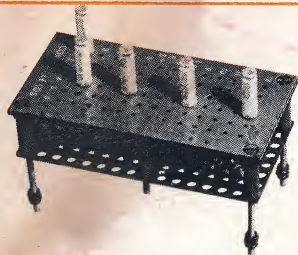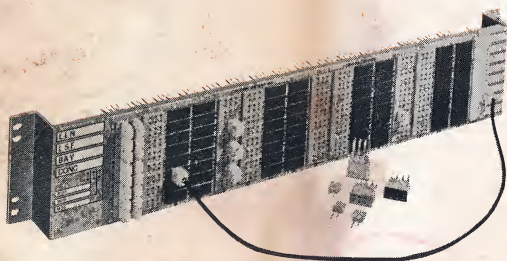|	
Automatic inspection	Automatic color matching
Automatic gaging	Automatic electrical testing
Automatic weighing	Automatic monitoring
Automatic blending	Traffic controls

Other available Sealectro Programming Devices

Send For: QUICK REFERENCE DATALOG

Represented by: